

3. Designing Environmentally Responsible Curricula

How do we equip our students to design and develop for sustainability and inclusivity?

**Teaching Sustainability and Design in Higher Education:
Lessons from Consumerism and Waste in the Developing World**

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Abstract

The research collected and presented in this paper is based on the author's first-hand account of the experiences and lifestyles of people living in and around Dodoma, the capital city of Tanzania.

This paper examines the contrasting attitudes of different cultures, especially the cultural differences that exist between Western-European and Tanzanian models of consumption and sustainability.

Introduction

In 2003 I visited Tanzania in East Africa, originally to study and contribute to the design of solar cookers, but during my stay I was asked to speak to a group of local schoolteachers, for no reason that I could determine other than that I happened to teach in a British University. However the ensuing conversation about design caused me to turn my attention to the consumerism in such a poverty stricken country where there were stark contrasts with the West.

Take, for example, a bucket. This is an important item in a country like Tanzania where water is often collected from a well or stand pipe. To a Tanzanian, a bucket was a bucket. The bucket would continue to be used until it no longer held water, and could not be repaired – even then, the raw material of the *ex*-bucket would be used to make something else: a knife handle, for example (fig. 1).



Figure 1. The knife handle is made from the plastic of an old bucket; the blade from a car panel

In the UK a bucket (manufactured in China) can be bought from a DIY shop for as little as £1. In some cases it will be discarded if it has merely started to look a bit dirty. The teachers had difficulty accepting our throw away culture, particularly when it came to expensive electrical goods. One of them described a trip he had made to England, a few years before:

"I stayed there [in the UK] for four days. I saw nothing strange except for the big buildings, but when we went in the village, on the way to their [the hosts] home I saw a skip. After passing two or three streets, I saw radios, sofa sets; I saw videos, so many things. They were outside. I just looked surprised. I asked, 'Won't they get stolen?' and they said, 'No they have thrown those things away.' Then I was very sorry. I said, 'Throwing away? Why?' 'Because they have new things.' Ah, it didn't enter my head."

It was explained that, in the UK, where most electrical goods on sale are manufactured cheaply on the other side of the world where labour costs are low, the cost of getting a radio repaired would be more than the original price paid for it. This the teachers easily understood, but that people would discard a perfectly good working radio or other electronic devices (or anything useful) the minute a more up-to-date one hit the shops was ludicrous.

In Tanzania radios might be repaired several times in their lifetime (see fig 2). When finally expired, any remaining working parts are used in other radios so that they may continue to work. The teacher gave another example of this.

"... this watch, if it is damaged, to repair in England is more expensive than buying a new one. So it is better to buy a new one than repairing this. And if you have replaced it, then this is nothing so you can throw it away. That is their principle. But here it is very different: it is very basic, very less money to repair. But to buy a new thing is still difficult. I can repair for £5, but to buy a new thing is £20 or £30, so I spend the £5."



Figure 2. Radio Repair Shop, Dodoma.

There was clearly a difference in the material culture of Tanzania to that of the UK, but sustainability was not at the core of this.

Design Issues for the Consumer

The design issue I had originally set out to look at was the question of how to reduce the amount of fuel used in domestic cooking. However, this problem is not down to

any energy crisis comparable with that often described in the Western media of looming petrol shortages and power cuts.

In Tanzania a power cut would only affect 10% of the population – that is the number of homes with a mains electricity supply. The fuel most use for cooking is wood, and this is becoming increasingly scarce as the population grows and trees are not replanted. In rural areas, women (it is always women) can spend up to 5 hours a day collecting enough wood just to cook. To counter this problem, the charity Sunseed Tanzania has, for several years, been encouraging the use of the Lorena stove, an enclosed oven, that in conjunction with a heat retention cooker can reduce the amount of wood used on the traditional 3 stone fire by up to 50%. That will also save up to two and a half hours a day¹.

There has been much work from various charities in Tanzania and other developing countries to promote the use of solar cookers to combat this problem with varying degrees of success. Solar cookers have been very successful in other parts of Africa, India, South America and China (Solar Cookers International, 2003), and having cooked with one myself, I can attest that they are very effective in sunny climates. However, there were two main factors hindering their popularity in the villages in rural Tanzania: firstly, there had been some considerable difficulty in persuading people to part from their traditional cooking methods, which always took place inside on a wood fire; and secondly there was cost.

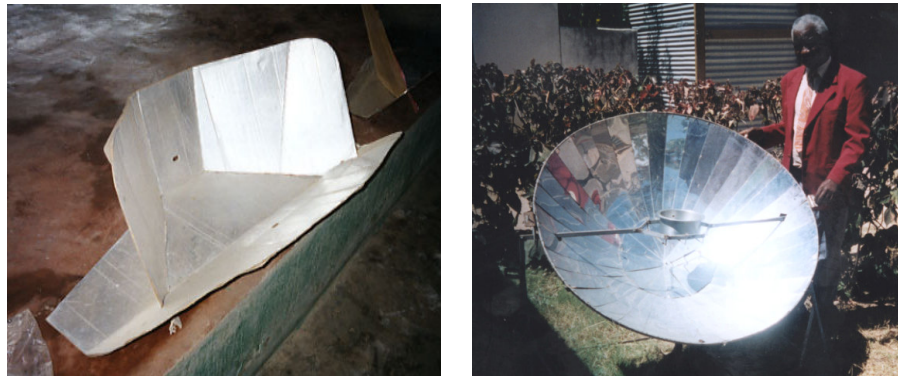


Figure 3. The Cookit (left, a) and Concave Reflector Cooker (right, b) with Pastor Fuataeli S. Muuisi, Lutheran Church of Tanzania

The concave reflector cookers (fig. 3b) cost approximately £40, and were beyond the earnings of rural Tanzanians. Even the simplest *cookits* (fig. 3a), made from an old cardboard box and tin foil were considered beyond the means of some. The bottom line was that open fires were simply quicker for cooking, and firewood lying around on the ground, although scarce, was also free.

At the same time, and much to my surprise, cardboard packaging was a local commodity, a raw material that was sold and not mere refuse as is usually the case in the UK. Indeed, many forms of packaging and refuse were routinely used as raw material for other products.

However, there is not an abundance of waste packaging. A former colleague who had worked as a packaging designer in communist Yugoslavia in the early 1980s found

¹ Data provided by Sunseed Tanzania, 2003

that in a non-competitive marketplace his work was straightforward. For example, washing powder came in card boxes that had only “*Washing Powder*” written on them.

In Tanzania a packaging designer would struggle to find work. On the stalls and shops in Dodoma market, washing powder came in plastic bags (see Fig. 4) with the price handwritten, stacked on a table alongside unpackaged old-fashioned bars of soap (half a metre long), buckets and sufurias.



Figure 4. Stall in Dodom, Tanzania. Little branding or packaging.

True, there was some evidence of branding in the form of widely seen Coca Cola and Fanta bottles, which were usually collected and refilled at the bottling plants, but in a country so poor, consumer decisions are made on physiological need. Even the branding on western-style clothing was meaningless to most.

There are those who might despair at such frivolity, but as consumers in the UK we are generally aware of the fact that some people would prefer to spend £39.99 for a corkscrew made by Alessi, when one can be found in PoundStretcher for £1.99. Although the Alessi corkscrew is arguably a more delightful item of superior manufacture, most of the additional price is for the *brand* value.

The material value of a *brand* was something I had much difficulty explaining in Tanzania. It has already been mentioned that in the UK a bucket can be bought for 99 pence. Alessi don't make buckets, but it occurred to me that if they did, they might retail at about £40 in Harvey Nichols.

When this notion was put to the schoolteachers, it was met with guffawing disbelief. “*Why?*” one man asked, “*Why would someone spend forty, when they can buy the same thing for one pound? This is madness.*”

Recycling and Sustainability

While there was an absence of branding and packaging on the market stalls per se, there was recycled packaging in the form of the kerosene lamps made from old food and drink cans (fig. 5).



Figure 5. Kerosene lamps (and a filling funnel) fabricated from discarded food and drinks cans.

The intricate and skilled manufacture of these items is a delight, but the reason for their abundance (they hang in their hundreds from the stalls) only becomes clear when reminded that so few homes have electricity.

The lamps are a vital and cheap means of lighting. They are made by hand, on the roadside or in doorways, by men using soldering irons, heated with kerosene primus burners, or in charcoal fires. The speed and skill with which these items are made is astonishing, especially given the limited resources they have. And the fact that they use reclaimed materials adds to the charm - but we should not be misled into believing that this is through some drive towards sustainability.

The cans are used because they are a ready, cheap and convenient material close to hand – they are used because there is nothing else. If the raw materials were cheaper, or simply there was no further use for this used packaging it would be dumped along the roadside and in streams along with the plastic bags and bottles (see fig. 6) for which there is much less potential for re-use.



Figure. 6 Rubbish tipped in a stream and by the side entrance to the market

Sustainable Design Education in the UK

There is no new discovery in what is described here. Victor Papanek (1971) described this resourcefulness with waste materials in the developing world over thirty five

years ago in his book *Design for the Real World*, and (maybe because of this) the approach to re-using discarded objects and materials in the creation of designed objects is still given as a good model for sustainable design when taught in many British Universities and Colleges, when, in fact, it is not really *sustainable* at all - take the delightful carafe (fig. 7) which designer Tord Boontje has re-fashioned from an empty wine bottle - I drink about four bottles of wine a week – how many of these carafes can one person need?



Fig. 7. Carafe and tumblers by Tord Boontje

Furthermore, Tom Dixon's 1998 book *Rethink* gives many delightful examples of how objects have been re-thought into new uses. The book does not claim to be about sustainable design, but this and books like it are given by design academics as a source for work in sustainable design.

Examples like this miss the point, and it is very misleading to students. While the kerosene lamps provide a charming example of recycling, it is hard to imagine these odorous and sooty items being the soul source of lighting in a UK home.

So too, the people of Dodoma would surely prefer electric lights. And while solar cookers do indeed use sustainable energy, would electric ovens, alongside running water in a clean kitchen, not be more preferable?

The job of the designer, then, is to provide this while having as little impact on our energy and materials resources as possible. That is not to say that we should *not* specify discarded or surplus objects in new designs, this can still be fun and challenging and does no harm as long as students are not misled into thinking that this alone will save the planet.

The Future

Sustainability in design and design education needs to be addressed from two points.

Firstly, from the necessity of the consumer to **Reduce**, which we already know – academics have for many years been telling us to reduce our material consumption in order to preserve our resources and reduce waste.

“Consumers are also implicated in this ecological crisis. In our greedy rush for more and more material goods in the West, we have seriously

neglected our links with nature and our responsibility to the environment...” (Papanek 1995, p12)

The Tanzanian approach of repair was summed up by the schoolteacher, *“Maybe that is one of the reasons which makes a difference between us: you throwing things, we maintaining.”* The “repair-and-make-do” attitude was widespread in Britain several decades ago before our reliance on the Far East for our manufactured goods, and we must think carefully about this again.

And while the absence of branding in Dodoma market was refreshing, it would again be naïve to assume that this was due for any other reason than that products are bought on physiological need.

Secondly, the necessity of the designer to think in terms of the title of William McDonough and Michael Braungart’s book *Cradle to Cradle* (2005). The problem is that on many UK design courses, sustainability is also often taught in terms of recycling – if a design can go end up in a recycling bin, it is deemed to be sustainable design – but as McDonough and Braungart point out, that where products are made from re-cycled materials it would be more accurate to describe this as,

“...down-cycling ... postponing the usual fate of products for a life cycle or two... they are still on their way to landfill, they’re just stopping off in your? home en route.” (2005, p4)

To this end, an entire shift in the way our products are designed manufactured is required.

Conclusion

Sustainable design is an important issue that can ill afford to be denoted by designs made from materials and objects reclaimed from a skip.

The problem is more succinctly summed up by Bruce Sterling (2005, pp 6-7),

“The world of organised artifice is transforming in ways that are poorly understood and little explored. There are two reasons why this is happening. First, new forms of design and manufacture are appearing that lack historical precedent, and are bound to create substantial novelty. Second, the production methods currently used are not sustainable. They are large in scale, have long histories and have been extensively researched and developed, but they can’t go on in their present form. The status quo uses archaic forms of energy which are finite and toxic. They wreck the climate, poison the population and foment resource wars. They have no future.

So the challenge at hand is to creatively guide the tremendous vectors of the first reason, so as to finesse the horrific consequences of the second reason.”

The lap-top computer that I am using to write this paper is an astonishingly useful, if at times infuriating, product that at the flick of a switch gives access to useful (and more often not useful) information and communication networks and because of this

machine, the efficiency of my working productivity has increased enormously. And I, like many others, am not about to give it up.

The problem, therefore, is how to keep producing and improving such machines - along with cars, telephones, refrigerators, cookers, and other extremely useful items, that in their current form and modes of manufacture *do* impact heavily on energy resources and materials - in such a way that minimises the effect of its production on the environment.

If we can make sophisticated items like this that only harm the environment in negligible terms, then we do not have to worry about making lampshades out of glass bottles or plastic cups – unless of course, they are beautiful, as some are.

This approach does at times possess an aesthetic quality and is appropriate, but all design cannot be like this. But all design must be sustainable, or to put it another way in the words of designer Steven Bailey, “*there is no such thing as green design.*”

Students should be taught about the subject, but in all of their studio practice sustainability must be a design criteria. For every major project, be it in Product, Architecture, or Graphic Design, that the project at least in part addresses sustainability should be on the assessment criteria of every assessor.

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